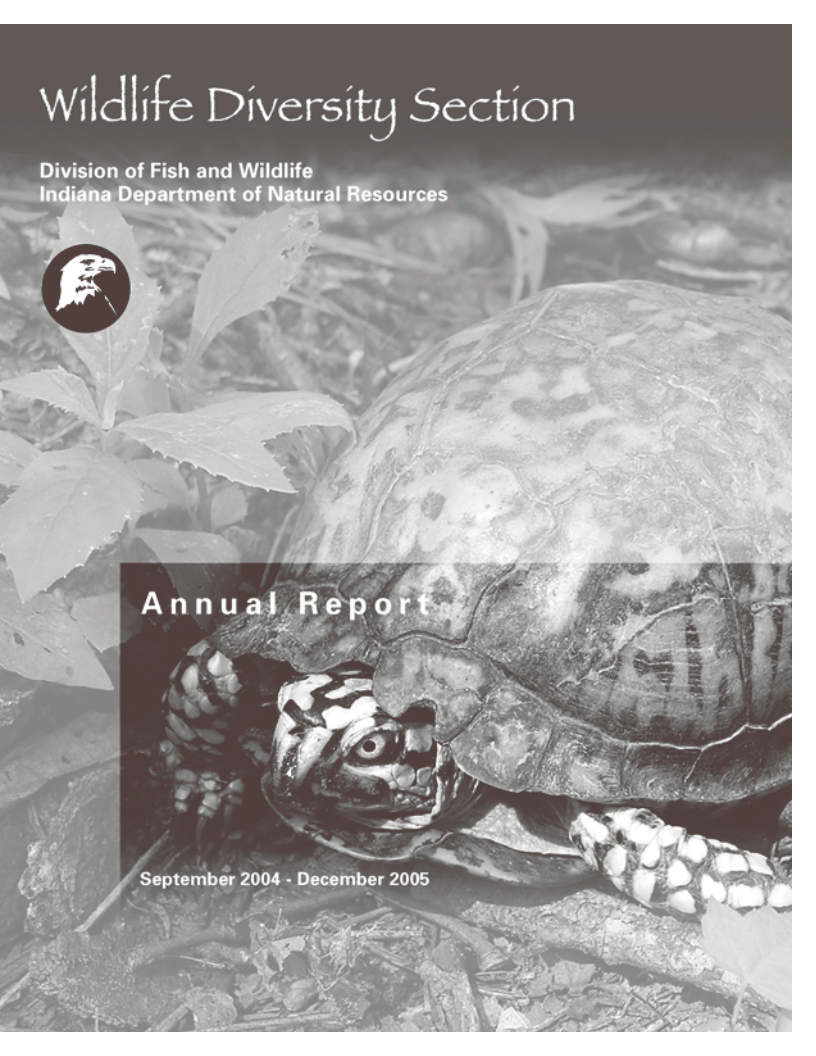
Wildlife Diversity Section

Division of Fish and Wildlife
Indiana Department of Natural Resources



Annual Report

September 2004 - December 2005

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Cover photo: The conservation of eastern box turtles is a major concern in Indiana; biologists are undertaking major studies of this long-lived species. See story on page 11. (Photo: WDS staff/IDNR)

Department of Natural Resources director

Kyle Hupfer

Division of Fish and Wildlife director

Glen Salmon

Wildlife Diversity Section chief

Catherine (Katie) Gremillion-Smith
Indianapolis,
317-232-8160
kgsmith@dnr.in.gov

Staff specialist

Kacie Ehrenberger
Indianapolis,
317-234-3361
kehrenberger@dnr.in.gov

Herpetologist

Zack Walker
Bloomington,
812-334-1137
zwalker@dnr.in.gov

Aquatic biologist

Brant Fisher
Edinburgh,
812-526-5816
bfisher@dnr.in.gov

Avian biologist

John Castrale
Mitchell,
812-849-4586
jcastrale@dnr.in.gov

Mammal biologist

Scott Johnson
Bloomington,
812-334-1137
sjohnson@dnr.in.gov

Sharpening Conservation's Focus

Message From the Director

In 2005, wildlife diversity conservation came into sharp focus nationally and in Indiana. Years from now, we'll look back on 2005 as a turning point for conservation of nongame wildlife and state-endangered species, when both achieved prominence like never before.

The catalyst for change is the Comprehensive Wildlife Strategy (CWS).

In 2003, as a condition to receive federal funds for wildlife conservation, Congress required each state to develop a CWS — a report card on the status and distribution of wildlife in each state. More than just grades, these strategies include an analysis of threats to wildlife and habitat; they also identify actions to address these threats.

Congress mandated that each strategy facilitate future coordination of conservation efforts and promote partnerships by developing the CWS with broad public input. To remain eligible for federal funds under the State Wildlife Grants Program, states and territories were required to submit an acceptable CWS to the U.S. Fish and Wildlife Service by October 2005.

From 2003 to 2005, the DNR collaborated with more than 100 partners, including state and federal agencies, agricultural groups, conservation and sportsmen's groups, academic professionals and other Hoosiers, to undertake this monumental effort to catalogue the state's species and habitats.

Now, we start on a new journey with our partners to step this broad strategy down into more specific wildlife action plans. Our goal is to develop new constituents, expand partnerships and work together to improve the quality of life for all Hoosiers. We'll address the needs of all fish and wildlife species by better conserving our shared habitats.

Fewer endangered species

2005 was a year of big successes for the badger, bobcat and river otter, all of which were removed from the Indiana endangered species list! They still are protected species in Indiana, and the Wildlife Diversity Section and its partners will continue to monitor them, but it is very encouraging to see populations of these unique animals moving away from the brink.

- Financial and logistical support from partners enabled the highly successful river otter restoration program. Otters were completely absent from Indiana when the project began in 1994; now they have taken up residence in 63 of Indiana's 92 counties and are doing very well.
- In the 1950s, badgers were reported in only 33 Indiana counties, but studies by WDS staff show that they expanded their range into at least 61 counties from 1994 to 1996, and additional evidence suggests they might be found in as many as 82 counties.
- Bobcats were first listed as state-endangered in 1969, and from 1970 to 1990, there were only seven confirmed reports statewide. But populations have rebounded markedly in the last 10 to 15 years, with 84 confirmed reports in 32 different counties (not counting 40 individuals that have been captured as part of an ongoing WDS study).

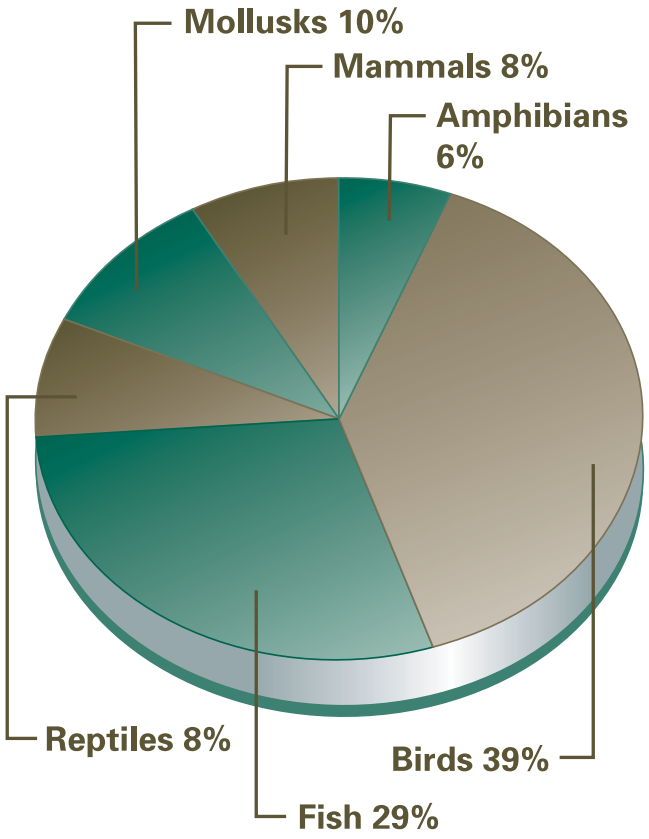
You can help us continue this exciting trend by supporting the Nongame and Endangered Wildlife Program (See how on page 35.)

More about this year's many accomplishments are in the following pages, so read on! Our future is bright, and the path to conserving Indiana's valuable wildlife and habitats much more clear. Collectively we have sharpened our focus on effective conservation, and together we are walking down a path toward a brighter future.

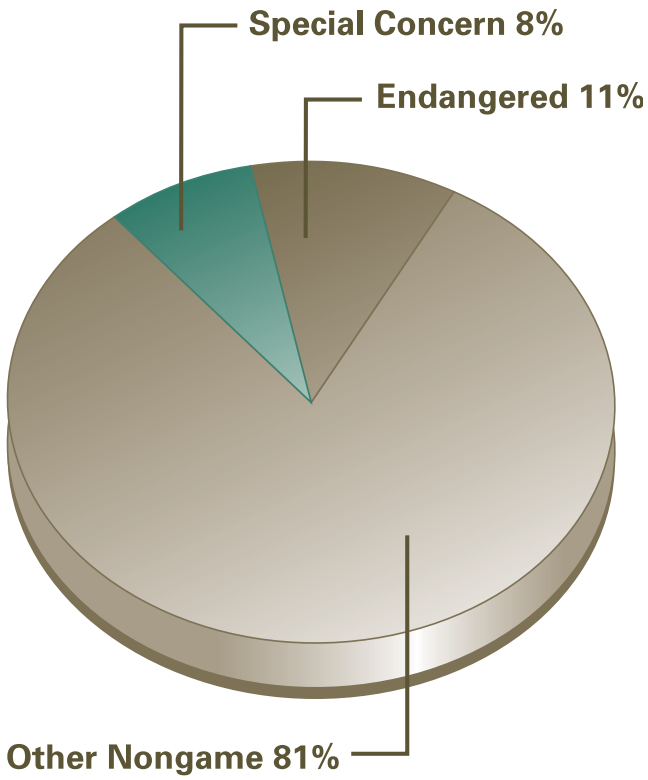
Kyle J. Hupfer
DNR director

Wildlife Diversity Section

Indiana's Wildlife



Indiana's Nongame Wildlife



The species classified as special concern or endangered in the state are the priority of the WDS.

WDS is responsible for the conservation and management of over 750 species of nongame and endangered wildlife. Nongame wildlife refers to any animal species that is not traditionally pursued through hunting, fishing or for commercial purposes. In Indiana, more than 90 percent of the state's mammals, birds, fish, mussels, reptiles and amphibians are nongame species. Many nongame species are common throughout the state — you can see them in any typical outdoor setting, including your own backyard! Endangered species are animal species in danger of disappearing from the state, and whose prospects for survival or recruitment within the state are in immediate jeopardy. This includes all species classified as endangered by the federal government that occur in Indiana.

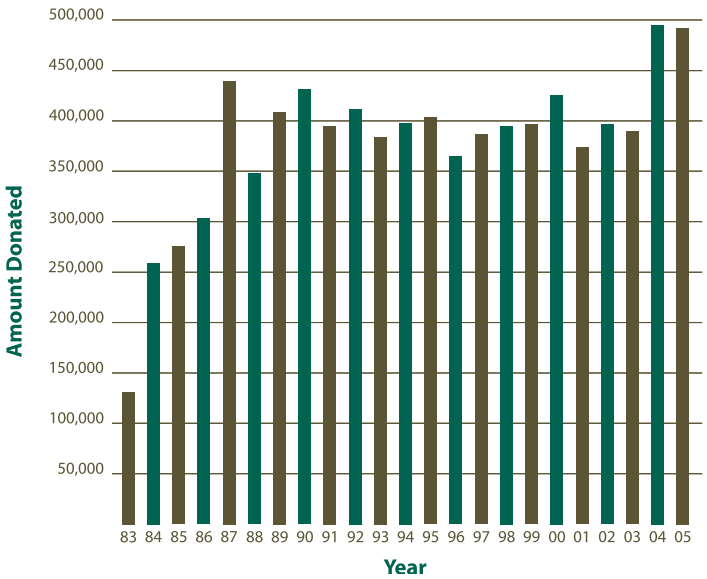
The WDS is part of the Division of Fish and Wildlife in the Department of Natural Resources. There currently are six staff members in the WDS, all with statewide responsibilities for nongame and endangered species. The chief and staff specialist both work in the Indianapolis DNR offices in the state government center. Our herpetologist and mammalogist are based in Bloomington, our ornithologist is in Mitchell, and our aquatics biologist is at Atterbury Fish and Wildlife area.

Funding the Projects of the WDS

Annual contributions to the Indiana Nongame Fund	
Year	**Amount Contributed**
1983	$133,000
1984	$265,000
1985	$275,000
1986	$304,108
1987	$443,427
1988	$349,847
1989	$411,112
1990	$433,247
1991	$394,421
1992	$413,484
1993	$384,894
1994	$396,987
1995	$403,033
1996	$362,909
1997	$388,209
1998	$391,300
1999	$392,300
2000	$449,000
2001	$375,000
2002	$392,400
2003	$390,561
2004	$492,907
2005	$489,610

Funding for the projects

of the Wildlife Diversity Section is generated through the Indiana Nongame Fund. In 1982, the state legislature established the Nongame Fund to be used exclusively for the protection, conservation, management and identification of nongame and endangered species.



The WDS and Nongame Fund receive no allocation from state revenues. Since the middle of the last century, the management of game fish and wildlife has been supported by federal aid programs and hunting and fishing license revenues (approximately $7.5 million per year). Starting in 2001, the State Wildlife Grants program has provided federal aid for nongame wildlife ($1 miilion per year).

It also is the responsibility of the WDS to seek partners, contributors and grants to fund its projects. Funding is used to provide continued support for WDS projects, including land acquisition, habitat restoration, contract research projects and staff. WDS projects are funded by the following:

Tax check-off and donations: Indiana income tax check-off allows taxpayers to give all or part of their state refund to nongame conservation. Citizens can also donate directly. From January 1, 2004, to December 31, 2005, the Nongame Fund raised $489,610 through direct donations and the tax check-off.

State Wildlife Grants: Most WDS projects are eligible for partial federal funding reimbursement through State Wildlife Grants, a program administered by the U.S. Fish and Wildlife Service. However, these funds are available only as reimbursements for expenditures. Once projects are approved, they are eligible to receive 50 to 75 percent reimbursement. Donations to the Nongame Fund allow the WDS to have the initial money needed to start the reimbursement cycle.

A big thank you!

The Wildlife Diversity Section staff thank all individuals and organizations who have contributed staff, time or financially to support its efforts! We are grateful for your support of nongame conservation. For more information on how you can contribute, *see page 35.*

Indiana's Species in Peril

The following are considered state endangered species or species of special concern. This list is available online at: www.dnr.IN.gov/fish/wildlife/endangered. It is accurate as of December 31, 2005.

Indiana classifications

Endangered: Any animal species whose prospects for survival or recruitment within the state are in immediate jeopardy and are in danger of disappearing from the state. This includes all species classified as endangered by the federal government which occur in Indiana.

Special Concern: Any animal species about which some problems of limited abundance or distribution in Indiana are known or suspected and should be closely monitored.

Federal classifications

Endangered: Any species that is in danger of extinction throughout all or a significant portion of its range. Federally endangered species are designated with (FE).

Threatened: Any species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Federally threatened species are designated with (FT).

Candidate: These species have been submitted for review for protection under the Federal Endangered Species Act. If added to the federal list, they will automatically be considered a state-endangered species. Candidates for the federal list are designated with (FC).

AMPHIBIANS

State Endangered

Common name	Scientific name
Hellbender	*Cryptobranchus alleganiensis*
Four-toed salamander	*Hemidactylium scutatum*
Red salamander	*Pseudotriton ruber*
Green salamander	*Aneides aeneus*
Crawfish frog	*Rana areolata*

State Special Concern

Common name	Scientific name
Common mudpuppy	*Necturus maculosus*
Blue-spotted salamander	*Ambystoma laterale*
Eastern spadefoot toad	*Scaphiopus holbrookii*
Northern cricket frog	*Acris crepitans*
Northern leopard frog	*Rana pipiens*
Plains leopard frog	*Rana blairi*

BIRDS

State Endangered

Common name	Scientific name
Trumpeter swan	*Cygnus buccinator*
American bittern	*Botaurus lentiginosus*
Least bittern	*Ixobrychus exilis*
Black-crowned night-heron	*Nycticorax nycticorax*
Yellow-crowned night-heron	*Nyctanassa violacea*
Osprey	*Pandion haliaetus*
Bald eagle (FT)	*Haliaeetus leucocephalus*
Northern harrier	*Circus cyaneus*
Peregrine falcon	*Falco peregrinus*
Black rail	*Laterallus jamaicensis*
King rail	*Rallus elegans*
Virginia rail	*Rallus limicola*
Common moorhen	*Gallunula chloropus*
Whooping crane (FE)	*Grus americana*
Piping plover (FE)	*Charadrius melodus*
Upland sandpiper	*Bartramia longicauda*
Least tern (FE)	*Sterna antillarum*
Black tern	*Chlidonias niger*
Barn owl	*Tyto alba*
Short-eared owl	*Asio flammeus*
Loggerhead shrike	*Lanius ludovicianus*
Sedge wren	*Cistothorus platensis*
Marsh wren	*Cistothorus palustris*
Golden-winged warbler	*Vermivora chrysoptera*
Kirtland's warbler (FE)	*Dendroica kirtlandii*
Henslow's sparrow	*Ammodramus henslowii*
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*

State Special Concern

Common name	Scientific name
Great egret	*Ardea alba*
Mississippi kite	*Ictinia mississippiensis*
Sharp-shinned hawk	*Accipiter striatus*
Red-shouldered hawk	*Buteo lineatus*
Broad-winged hawk	*Buteo platypterus*
Sandhill crane	*Grus canadensis*
Common nighthawk	*Chordeiles minor*
Whip-poor-will	*Caprimulgus vociferus*
Cerulean warbler	*Dendroica cerulea*
Black-and-white warbler	*Mniotilta varia*
Worm-eating warbler	*Helmitheros vermivorus*
Hooded warbler	*Wilsonia citrina*
Western meadowlark	*Sturnella neglecta*

FISHES

State Endangered

Common name	Scientific name
Northern brook lamprey	*Ichthyomyzon fossor*
Lake sturgeon	*Acipenser fulvescens*
Redside dace	*Clinostomus elongatus*
Pallid shiner	*Hybopsis amnis*
Greater redhorse	*Moxostoma valenciennesi*
Northern cavefish	*Amblyopsis spelaea*
Bantam sunfish	*Lepomis symmetricus*
Variegate darter	*Etheostoma variatum*
Channel darter	*Percina copelandi*
Gilt darter	*Percina evides*

State Special Concern

Common name	Scientific name
Pugnose shiner	*Notropis anogenus*
Bigmouth shiner	*Notropis dorsalis*
Longnose dace	*Rhinichthys cataractae*
Longnose sucker	*Catostomus catostomus*
Northern madtom	*Noturus stigmosus*
Ohio river muskellunge	*Esox masquinongy ohioensis*
Cisco	*Coregonus artedi*
Lake whitefish	*Coregonus clupeaformis*
Trout-perch	*Percopsis omiscomaycus*
Slimy sculpin	*Cottus cognatus*
Banded pygmy sunfish	*Elassoma zonatum*
Western sand darter	*Ammocrypta clara*
Spotted darter	*Etheostoma maculatum*
Cypress darter	*Etheostoma proeliare*
Tippecanoe darter	*Etheostoma tippecanoe*

MAMMALS

State Endangered

Common name	Scientific name
Southeastern myotis	*Myotis austroriparius*
Gray myotis (FE)	*Myotis grisescens*
Indiana myotis (FE)	*Myotis sodalis*
Evening bat	*Nycticeius humeralis*
Swamp rabbit	*Sylvilagus aquaticus*
Franklin's ground squirrel	*Spermophilus franklinii*
Allegheny woodrat	*Neotoma magister*

State Special Concern

Common name	Scientific name
Pygmy shrew	*Sorex hoyi*
Smoky shrew	*Sorex fumeus*
Star-nosed mole	*Condylura cristata*
Little brown myotis	*Myotis lucifugus*
Northern myotis	*Myotis septentrionalis*
Silver-haired bat	*Lasionycteris noctivagans*
Eastern pipistrelle	*Pipistrellus subflavus*
Red bat	*Lasiurus borealis*
Hoary bat	*Lasiurus cinereus*
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*
Plains pocket gopher	*Geomys bursarius*
Least weasel	*Mustela nivalis*

MOLLUSKS

State Endangered

Common name	Scientific name
Longsolid	*Fusconaia subrotunda*
White wartyback (FE)	*Plethobasus cicatricosus*
Orangefoot pimpleback (FE)	*Plethobasus cooperianus*
Sheepnose (FC)	*Plethobasus cyphyus*
Clubshell (FE)	*Pleurobema clava*
Rough pigtoe (FE)	*Pleurobema plenum*
Pyramid pigtoe	*Pleurobema rubrum*
Rabbitsfoot	*Quadrula cylindrica cylindrica*
Eastern fanshell (FE)	*Cyprogenia stegaria*
White catspaw (FE)	*Epioblasma obliquata perobliqua*
Northern riffleshell (FE)	*Epioblasma torulosa rangiana*
Tubercled blossom (FE)	*Epioblasma torulosa torulosa*
Snuffbox	*Epioblasma triquetra*
Pink mucket (FE)	*Lampsilis abrupta*
Fat pocketbook (FE)	*Potamilus capax*

State Special Concern

Common name	Scientific name
Ohio pigtoe	*Pleurobema cordatum*
Salamander mussel	*Simpsonaias ambigua*
Wavyrayed lampmussel	*Lampsilis fasciola*
Round hickorynut	*Obovaria subrotunda*
Kidneyshell	*Ptychobranchus fasciolaris*
Purple lilliput	*Toxolasma lividus*
Ellipse	*Venustaconcha ellipsiformis*
Rayed bean (FC)	*Villosa fabalis*
Little spectaclecase	*Villosa lienosa*
Pointed campeloma	*Campeloma decisum*
Swamp lymnaea	*Lymnaea stagnalis*

REPTILES

State Endangered

Common name	Scientific name
Alligator snapping turtle	*Macrochelys temminckii*
Eastern mud turtle	*Kinosternon subrubrum*
Spotted turtle	*Clemmys guttata*
Blanding's turtle	*Emydoidea blandingii*
Ornate box turtle	*Terrapene ornata*
Hieroglyphic river cooter	*Pseudemys concinna*
Butler's garter snake	*Thamnophis butleri*
Copperbelly water snake (FT)	*Nerodia erythrogaster (northern population)*
Kirtland's snake	*Clonophis kirtlandii*
Smooth green snake	*Liochlorophis vernalis*
Scarlet snake	*Cemophora coccinea*
Southeastern crowned snake	*Tantilla coronata*
Cottonmouth moccasin	*Agkistrodon piscivorus*
Massasauga (FC)	*Sistrurus catenatus*
Timber rattlesnake	*Crotalus horridus*

State Special Concern

Common name	Scientific name
Western ribbon snake	*Thamnophis proximus*
Rough green snake	*Opheodrys aestivus*

Top News for 2005

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INSIDE

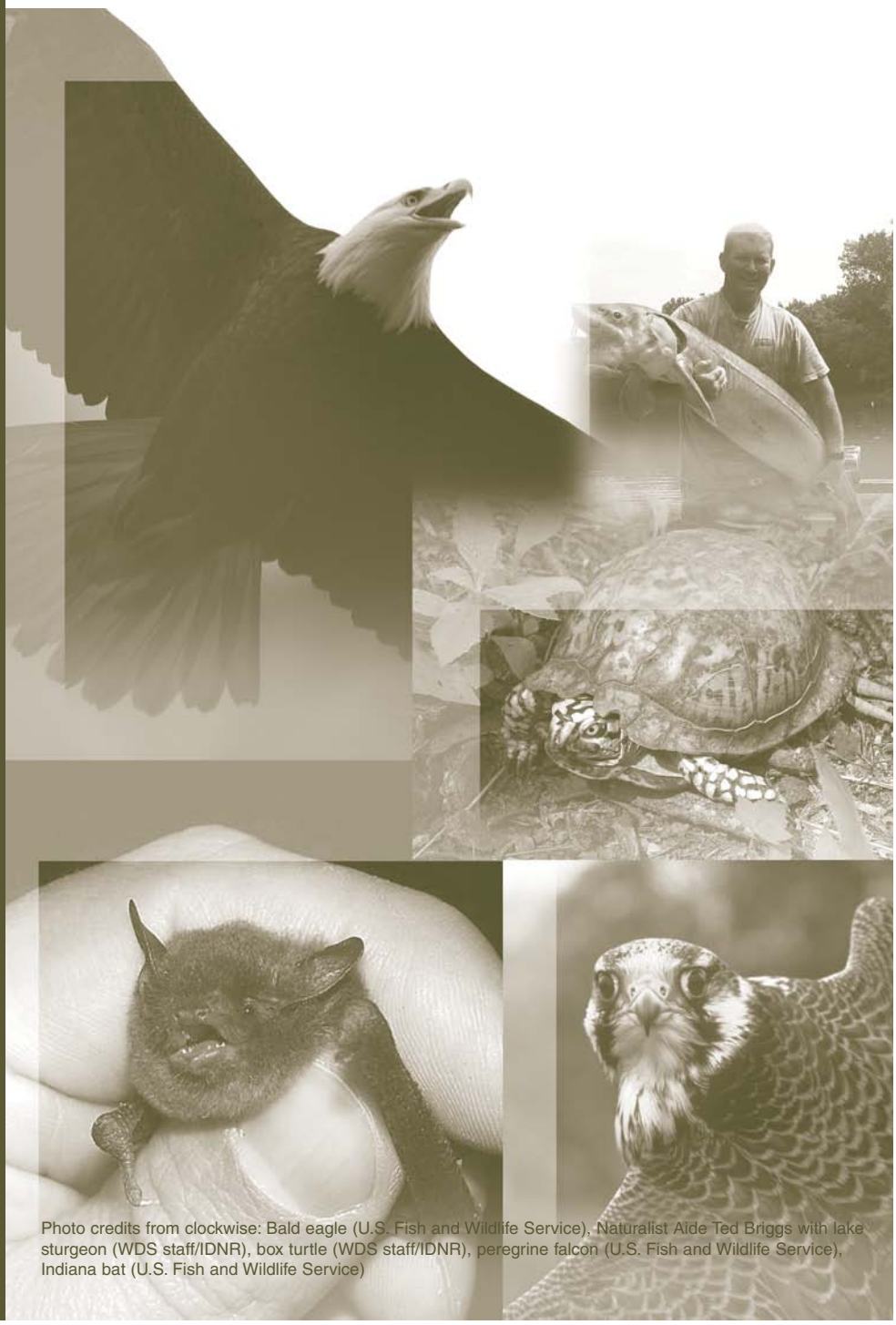


Photo credits from clockwise: Bald eagle (U.S. Fish and Wildlife Service), Naturalist Aide Ted Briggs with lake sturgeon (WDS staff/IDNR), box turtle (WDS staff/IDNR), peregrine falcon (U.S. Fish and Wildlife Service), Indiana bat (U.S. Fish and Wildlife Service)

Land Stewardship

By Katie Gremillion-Smith, WDS chief

WDS protects, manages and restores habitats important to the species of greatest conservation need. (WDS staff/IDNR)

Indiana's new Comprehensive Wildlife Strategy (see article page 8) identified problems affecting wildlife in Indiana and their degrees of severity. It was no surprise (but validated what we already knew) when the CWS identified the top three issues:

Loss of breeding habitat.
Loss of feeding habitat.
Degradation of movement or migration routes.

The facts are clear: Indiana's wildlife is vastly impacted by decreasing spaces or the quality of places to live.

In 2005, the Wildlife Diversity Section (WDS) stepped up efforts to protect, manage and restore habitat important to species of greatest conservation need. Through productive partnerships, we have been able to acquire more public conservation lands, maintain rare habitat and restore wetlands for Indiana's neediest wildlife. Let's take a look our biggest successes in 2005.

Goose Pond: After almost 50 years of working and wishing, Goose Pond is at last in public ownership thanks to the assistance of many partners. Goose Pond is an 8,000-acre glacial basin near Linton in Greene County. Once an expansive, thriving wetland, the land was drained and pumped dry early in the last century. Today, efforts are underway to restore the area's wildlife splendor and provide public access.

The WDS was able to provide funds through State Wildlife Grants and an Endangered Species Habitat Conservation Plan grant. WDS directed $1.9 million from these federal grant programs (administered by the U.S. Fish and Wildlife Service) to the overall cost of $8 million.

As Goose Pond is restored, DNR can step up conservation efforts for rare species, such as shorebirds, crayfish frogs and northern harriers. Most of Goose Pond is under a wetland conservation easement through the Natural Resources Conservation Service (NRCS), which is actively restoring its wetlands. (The easement ensures that the wetland habitats will be maintained, providing conservation values such as wildlife habitat and flood control for future generations.) The Division of Fish and Wildlife manages the property. Property maps and a bird list can be found at www.in.gov/dnr/fishwild/goosepond.

Tern Bar Slough Wildlife Diversity Area: Wetland restoration efforts and the construction of an interior least tern nesting island are planned for spring 2006 at Tern Bar Slough in Gibson County. This 840-acre property is adjacent to the Cane Ridge Wildlife Management Unit at Patoka National Wildlife Refuge where least terns successfully nested this past summer.

DNR Division of Engineering is guiding construction of an additional least tern nesting island, with assistance from Cinergy, Inc., owner of neighboring Gibson Lake. Tern Bar Slough is under a wetland conservation easement through NRCS, which guides and supports the wetland restoration. Many other migratory bird species, rabbits and deer will benefit by Tern Bar Slough's restoration.

Bob Kern Nature Preserve: Indiana DNR purchased 168 acres on southeast shore of Lake Manitou near Rochester in Fulton County from the Indiana Chapter of The Nature Conservancy (TNC) using State Wildlife Grant funds (administered by the U.S. Fish and Wildlife Service).

Mr. Kern, a visionary conservationist, wanted to set aside his land as a nature preserve; he sold the tract to the TNC shortly before his death in 2004. TNC made the property available to the state for approximately half the appraised value of $675,000. The property will be managed jointly by the Division of Fish and Wildlife and the Division of Nature Preserves.

The nature preserve will allow DNR to protect unique lakeshore habitat and resident wildlife species such as American bittern, marsh wren, sedge wren, least bittern, Virginia rail and Blanding's turtle.

Growing partnerships

Rare species are often found in rare habitats. Endangered species conservation depends on the preservation and maintenance of unique areas that support uncommon plants, animals and communities.

For years the WDS has appreciated the work of the Division of Nature Preserves and The Nature Conservancy in cataloging, protecting and managing the remaining best examples of Indiana's native prairie, savannahs, glades, fens, bogs and barrens. These areas support rare species from warblers to skippers to rattlesnakes.

Over a 3-year grant period, the WDS is making $250,000 of State Wildlife Grant funds available to the Division of Nature Preserves to maintain these rare habitats. The Division of Nature Preserves and TNC are providing matching dollars needed to secure these federal funds. The reimbursement will be returned to the Division of Nature Preserves to hire external contractors to manage additional rare habitats. Such management requires extensive work to control invasive woody and exotic plant species, burn prairies and plant prairie seeds.

In today's world, rare habitats don't take care of themselves. Active management is required to maintain the integrity of fragmented habitats and control invasive, exotic plant and animal species. With partners like Division of Nature Preserves and TNC, we can ensure these special places are there for special species for a long time to come. We thank our partners for their support and efforts!

Short-eared owl at Goose Pond (John Maxwell/IDNR)

Helping critters where they live

One of the biggest conservation success stories in 2005 was the purchase and ongoing restoration of Goose Pond in southwest Indiana.

In the early 1900s, this 8,000-acre wetland was pumped dry for farmland. Last year, the property was bought for $8 million. Today, the DNR and the Natural Resources Conservation Service are returning Goose Pond to its original wetlands, forests and grasslands.

Goose Pond is just one example of how biologists are approaching Indiana's wildlife conservation in the 21st century, says Katie Smith, Wildlife Diversity Section chief. The DNR will now focus on habitat conservation for all wildlife.

The guide for this new approach is the Comprehensive Wildlife Strategy, which addresses the needs of all fish and wildlife species by better conserving habitats. Goose Pond's restoration started before CWS was completed, but it shows the direction we're planning to go.

Working with state and federal agencies, agricultural groups, conservation and sportsmen's groups, academic professionals and other Hoosiers, Indiana DNR ambitiously developed the strategy in 2005, offering a long-term blueprint for conservation.

What the strategy does

The Comprehensive Wildlife Strategy places big emphasis on biodiversity to manage all species by focusing on where they live, Smith notes. Instead of managing wildlife one species at a time (the traditional approach), biologists are using the strategy to protect, restore and enhance entire habitats, helping many species simultaneously.

The strategy also captures existing efforts and interests of more than 100 Indiana wildlife conservation partners, allowing them to share the work load and reach conservation goals by pooling resources. The next step is to work with partners to develop a state wildlife action plan. The plan will assess existing conservation efforts and address priority needs where limited time and money can be most effective.

Why the new approach?

Today's wildlife conservation is increasingly complicated. Biologists are more aware of the sheer numbers of fish, mammals, reptiles, insects and the natural areas that make nature viable. The greatest threats to wildlife are habitat loss and fragmentation. Additional threats include invasive, non-native wildlife and new diseases. Biologists must consider how these forces impact numerous species and habitats simultaneously.

The health of wildlife is an early indicator of disease and pollution that affect us all. Indiana's new approach to wildlife conservation allows biologists to identify and prevent problems before they threaten wildlife and affect people.

The Comprehensive Wildlife Strategy is the start of a bigger financial solution as well. There often aren't enough funds to go around, and existing funds are earmarked by law for specific conservation purposes. By completing a strategy according to federal guidelines, Indiana is eligible for federal dollars to focus on priority areas that need attention but haven't always received it.

Most welcome change

Through Indiana's Comprehensive Wildlife Strategy, the DNR can better manage wildlife.

As Indiana continues to grow and change, this new conservation approach can help the DNR fulfill its responsibility to conserve wildlife and the places they live, says Smith. This is an investment in the future, and a change that is most welcome.

For more information on the Comprehensive Wildlife Strategy, go to www.djcase.com/incws.

Amphibians and Reptiles

By Zack Walker, herpetologist

Common snapping turtle (WDS staff/IDNR)

Worldwide, herpetofauna (amphibians and reptiles) have experienced dramatic population declines in recent years. These declines can be attributed to factors such as wetland drainage, controlled water flows, climate change, stream contaminants and habitat developed for agriculture, mining and urban uses. Indiana biologists are concerned about our native herp populations and their current status. Because of this concern, steps are being taken to document Indiana's reptiles, amphibians and their habitats.

Biologists seek to gather information on species diversity, habitat preferences and overall health of herp populations. In addition, many herps indicate whether waters are clean or polluted, doing better or getting worse. When biologists know what is happening with herps, they can better determine the health of our natural resources. This information helps conversationalists take steps to help improve habitat for herps and people alike.

Herp sampling: Determining what's in Indiana

In 2004, biologists phased in a wildlife monitoring program to help determine long-term population trends of amphibians and reptiles on state fish and wildlife areas. Tri-County Fish and Wildlife Area was the first site used in this program. In 2005, a second monitoring site was established at Winamac FWA.

In both areas, a series of six transects (or sampling plots) were constructed to monitor herpetological population trends. Each transect consists of 20 paired coverboards — boards placed on the ground to mimic natural logs — to attract amphibians and reptiles looking for habitat. Spaced 25 meters apart, the coverboards were monitored nine times throughout the summer. At Tri-County FWA, biologists reported 56 individual animals from seven species; at Winamac FWA, biologists captured 23 individual animals from four species.

In 2006, Wildlife Diversity Section staff will develop another long-term amphibian and reptile monitoring site at Hovey Lake FWA. Tri-County and Winamac will be surveyed again in 2006.

The skinny on crawfish frogs and mole salamanders

Biologists run surveys for state-endangered species and species of special concern. The crawfish frog *(Rana areolata)* and mole salamander *(Ambystoma talpoideum)* were the focus for 2005.

Surveys for the state-endangered **crawfish frog** took place

in spring 2005. Biologists made stops along driving routes at night in likely habitat. At each stop, they listened for the distinctive call that often reminds listeners of grunting hogs at feeding time. Survey routes ran through Daviess, Greene, Jefferson, Knox, Sullivan and Vigo counties in southwestern Indiana. Surveyors found crawfish frog populations in all but Daviess and Knox counties.

Results were consistent with what was expected. Traditionally these counties have been a stronghold for the crawfish frog. Daviess and Knox counties typically contain more sandy soils that are not preferred by burrowing crawfish that provide homes for crawfish frogs. However, it is good to see that this species is still present in this part of its range.

Mole salamanders were the surprise discovery in 2004 when biologists discovered a breeding population in a Posey County swamp. Speculated to be an isolated remnant of an historic population, the salamanders, which


Mole salamander (WDS staff/IDNR)

are bluish in color with lighter flecking, received official protection last year as a native species. (The mole salamander is not a state endangered species at this time. However, the state is reviewing the status of the species.) WDS and Purdue University scientists went back to the swamp in 2005. Using funnel traps and dip nets, biologists captured breeding pairs of the salamanders, which largely live underground, as well as salamander larvae. Biologists found no new populations of mole salamanders in 2005.

The results don't mean anything as of yet. We will survey again for this species in 2006 and look for additional colonies. The window of time to observe this species is relatively short, and multiple field seasons are needed to accurately gauge their distribution.

North American Amphibian Monitoring Program

Biologists collect breeding information for Indiana's 17 frog and toad species through the North American Amphibian Monitoring Program. Biologists worldwide study amphibians closely because of concerns about declining populations. In Indiana, the crawfish frog is state endangered. The northern leopard frog, plains leopard frog and cricket frog are species of special concern.

Each year, the DNR recruits more than 40 volunteers to recognize mating calls of Indiana's native amphibians while collecting data on assigned roadside survey routes. (Staff specialist Kacie Ehrenberger and herpetologist Zack Walker conducted training sessions to teach new volunteers the ropes.) Volunteers pick or are assigned routes, most often near where they live. Throughout the summer, volunteers follow strict protocols including acceptable sampling periods and data collection requirements.

Each route has a number of stops near ponds, rivers, lakes, streams, woods, farm fields and other frog habitat. At each stop, observers listen for five minutes, often sorting through a cacophony of frog song. They record data for each species heard, as well as information on weather and local conditions. For the 2005 breeding season, volunteers and biologists submitted data for 33 routes statewide. (You can access this data at: www.pwrc.usgs.gov/naamp.)

The Indiana program supplements national efforts of the North American Amphibian Monitoring Program. Indiana's effort was the focus of numerous local newspaper articles in 2005, as more citizens understand and are concerned about amphibians and reptiles. Amphibians are good indicators of significant environmental changes.

Beginning in 2006, Indiana volunteers are required to take an online quiz to demonstrate their ability to identify calls. Quiz scores will be used to strengthen NAAMP data in statistical models. NAAMP is the first citizen science program (i.e., volunteer-based) to incorporate a standard for participants involved in data collection. Anyone can practice identifying frog calls by using the public quiz at: www.pwrc.usgs.gov/frogquiz.

Frog surveys: A great way to date

When we studied lists of our NAAMP volunteers, we noticed an interesting trend. Many volunteers take along the same person (a significant other, friend or family member) each time out to help complete surveys. By reviewing data, we find that few volunteers are able to accomplish all survey tasks alone. It seems that frog monitoring presents a time for friendship and togetherness and to do something great for conservation. Maybe that frog will turn into a prince after all!

Crawfish frog (WDS staff/IDNR)

Snapping Turtles: Balancing status and regulations

The common snapping turtle *(Chelydra serpentina)* currently is listed as an Indiana game species, meaning that it can be harvested following the states' regulations and seasons. Currently, 25 snapping turtles can be harvested daily with a maximum possession limit of 50. However, little is known about the demographics of this species in Indiana.

In 2004, WDS biologists began a 4-year snapping turtle study to examine this species in relation to current management practices. Biologists anchored turtle traps in Lake Monroe to capture resident turtles. At each trap site, they set two hoop nets and a box trap with turtle delicacies such as cat food, sardines or frozen fish. All turtles were measured, marked, examined and realeased at their point of capture. Data taken from captured individuals includes carapace length and width, weight, approximate age and sex. Each turtle's shell was marked with a unique series of small notches to aid in identification. During 2005, no nests or juveniles were located within the study area.

The average weight of captured snapping turtles was 8 pounds. The largest turtle weighed 22 pounds. The average carapace length of captured snapping turtles was 12 inches. The largest turtle carapace length was 15 inches.

Four turtle species were captured within the study area: painted turtle, red-eared slider, musk turtle and snapping turtle. No snapping turtles were recaptured from 2004. Recapture of marked snapping turtles can provide information on individual growth rates and survival. It is important to gather this information on Indiana's snapping turtles to correctly manage this species.

Tuning-in to eastern box turtles

Biologists turned their dials to the eastern box turtle radio-telemetry project during the summer of 2005. This survey focused on movement patterns and population densities of eastern box turtles *(Terrapene carolina)* in southern Indiana. Three areas have been selected in south-central Indiana to be a part of the project (Figure1).

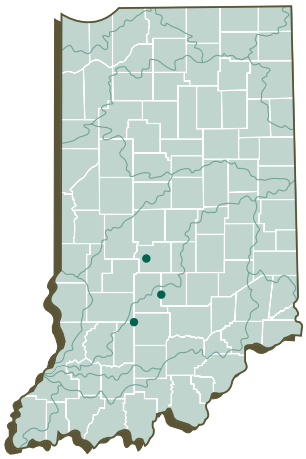


Figure 1. Indiana box turtle study areas.

Conservation of box turtles is a major concern. Once-robust box turtle populations are in a precarious condition due to habitat destruction and fragmentation that makes reproduction difficult and increases chances of being killed on roads. They also are adversely affected by human collection for pets, the pet trade and Asian food markets. Turtles are sensitive to chemical and hormonal pollution and introduced pathogens. Long-term studies are important to adequately understand the status of these long-lived, late-maturing species for their conservation and protection.

During Indiana's 2005 survey, three turtles from each study site were fitted with Holohil radio transmitters, which are about the size of a 9-volt battery topped with antenna that curves around the top of the carapace. Three males and six female box turtles were monitored as part of this project. Radioed turtles were tracked approximately three times per week. Biologists recorded data including turtle behavior, weather conditions, nearby habitat variables, ground temperature and air temperature.

A unique shell marking system was used to mark and identify captured turtles. A total of 17 females and 22 males were recorded within or adjacent to

study sites. In 2005, three marked box turtles were recaptured from the 2005 field season, while one turtle was recaptured from 2004.

While tracking turtles, researchers observed three different mating encounters. Three turtle nests were found during the course of the study.

This study is part of recent approaches to box turtle conservation in Indiana. In 2004, collection was prohibited from the wild to help protect Indiana's box turtle population. For information on turtles and rules regarding them, go to www.in.gov/dnr/fishwild/endangered/turtle.htm.

NAAMP volunteer of the year

A big congratulations goes to Wendell Zetterberg, our North American Amphibian Monitoring Program 2005 Volunteer of the Year! We had so many outstanding volunteers that we decided to enter everyone who completed the minimum requirements for volunteers into a drawing. Wendell was chosen randomly from the final list. He was an excellent choice because he is one of many volunteers who helped update his route map. Wendell also has emailed us several times with questions or suggestions to help make this program run better. Along with our gratitude, Wendell has received a frog pewter pin.

Hellbenders at home in the Blue River

The state-endangered hellbender salamander *(Cryptobranchus alleganiensis)* has been the focus of studies in the Blue River in southern Indiana since 1996. Biologists monitor long-term hellbender populations in this area.

Hellbender salamander (WDS staff/IDNR)

In 2005, biologists expanded sampling to locate juveniles and increase sampling efficiency. We will continue to evaluate these new techniques.

Annual collections range from 12 to 49 hellbenders, with an average of 23 individuals. Biologists glean basic information on weight, length, sex and location of capture; hellbenders are permanently marked for future identification. Several nests have been located during the last 11 years of survey, but no juvenile hellbenders have been seen.

As America's largest aquatic salamander, mature hellbenders range from 12 to 29 inches. They eat crayfish, small fish, snails and worms, and vary in color from olive-brown to black. As if the hellbender's name isn't colorful enough, it is also known as a devil dog, mollyhugger, mud cat, snot-otter and grampus.

Controlling invasive wall lizards

In 2003, DNR staff reported a population of common wall lizards *(Podarcis muralis)* at Falls of the Ohio State Park near Clarksville. The common wall lizard is a European native to Spain, Belgium, the Netherlands and Italy. In its native habitat, this species prefers rocky or woody areas with sparse vegetation. In 1952, a few common wall lizards were released in Cincinnati, Ohio. Since that time, the wall lizard has become firmly established in Ohio and Kentucky.

The origin of the Indiana population is unknown, but illegal intentional release is assumed. Areas of riprap along the banks of the Ohio River serve as an excellent habitat for this species. In 2004 and 2005, biologists documented wall lizards reproducing in increasing numbers.

Due to concerns over the increasing numbers of wall lizard sightings and potential negative impacts on native lizards and skinks, a wall lizard control program was initiated in 2005. Wall lizards were captured using glue boards, by hand and with lizard nooses. The wall lizard population and the effectiveness of the control program will be evaluated in 2006. Invasive species are considered a threat to native biological diversity. The release of any animal, plant or viable plant part is illegal on public lands.

Aquatic Species

By Brant Fisher, aquatic biologist

Freshwater mussels (WDS staff/IDNR)

The aquatics program within of the Wildlife Diversity Section is mostly concerned with nongame fishes and freshwater mussels.

There are more than 200 species of fish in Indiana, and three quarters of these are considered nongame (not fished). Most work concerns species on Indiana's endangered and special concern lists (see page 4). Intensive surveys of several species that previously were on the state endangered list revealed that they were more common than believed, resulting in delisting.

Seventy-seven species of freshwater mussels are native to Indiana. An ongoing statewide inventory will allow updates to our state-endangered and special concern lists. Freshwater mussels are one of the most endangered groups of organisms in Indiana, with more than half of our native species either extirpated (gone from the state) or listed as endangered or species of special concern.

Lake sturgeon are reproducing in East Fork White River

WDS biologists verified in 2005 that lake sturgeon *(Acipenser fulvescens)* are reproducing

Lake sturgeon spawning facts

Lake sturgeon are one of Indiana's largest fish. They also are one of the longest-lived and slowest to mature. Males don't reach sexual maturity until about 15 years of age, and females require about 20 years. Both sexes can easily live more than 50 years.

Prior to spawning, adult sturgeon form groups in deep holes near the spawning site. Sturgeon may perform staging displays that include rolling near the bottom and splashing near the surface.

Spawning takes place in areas of clean rock with current over it. A mature lake sturgeon can lay from 100,000 to 800,000 eggs during a single spawning season. Scattered by currents, the eggs stick to rocks and logs. Young hatch in five to eight days after fertilization and grow rapidly.

Lake sturgeon are imperiled in all states where they occur – primarily through the Northeast, Midwest and Southeast. Because they are slow to mature and have specific habitat requirements, they do not respond very quickly to conservation measures and recovery takes a long time.

successfully in the East Fork White River, although at relatively low levels. This is great news for this state-endangered species.

Information from the study will help WDS and its partners to protect and possibly enhance key spawning areas. Knowing where lake sturgeon spawn could also provide the opportunity for possible artificial propagation if necessary.

Long-term studies: Lake sturgeon have long been the subjects of study. In 1996 WDS staff first began to study a remnant population of lake sturgeon in the East Fork downstream of Williams Dam in Lawrence County. DNR has conducted annual trammel and gill net sampling *(see sidebar)* since 1996, and nearly 100 individual lake sturgeon have been identified. Many have been captured several times during the course of the study. Captured lake sturgeon range from four to more than 100 pounds in weight, although a typical specimen weighs about 30 pounds. Collection of several smaller individuals during the past couple of years proves that recent reproduction has occurred.

What are trammel and gill nets?

Trammel and gill nets are special nylon (multifilament) entanglement nets that are used by biologists but are not legal for public use. They can be drifted (active sampling) or set stationary (passive sampling). These nets have a weighted bottom lead line and a floatable top line with mesh between. Nets commonly use in the East Fork are 120 x 8 feet in size. During our sets for lake sturgeon, we commonly catch other fishes such as shovelnose sturgeon, paddlefish, freshwater drum and smallmouth buffalo. These are released unharmed.

Since 2002, biologists have fitted 16 lake sturgeon with transmitters for tracking. Radio telemetry helps identify spawning areas and determine movement patterns. Since the telemetry study began, lake sturgeon have shown similar, annual movement patterns.

Naturalist Aide Ted Briggs with lake sturgeon (WDS staff/IDNR)

2005 study: During the first week of April 2005, lake sturgeon were tracked once again to Williams Dam, as in past years. However, for the first time, actual lake sturgeon spawning was documented. Several fish spawned along a rocky shoreline downstream of Williams Dam. Biologists collected a small amount of eggs and took them to Cikana State Fish Hatchery in Martinsville to determine their viability. More than a dozen larval lake sturgeon hatched from these eggs. Larval lake sturgeon also were collected from the river using larval drift nets set below the spawning area. Throughout the course of this study, tissue samples also were taken from lake sturgeon. Dr. Gene Rhodes and Andrea Drauch with Purdue University's Department of Forestry and Natural Resources is conducting research to determine the genetic structure and uniqueness of the East Fork White River lake sturgeon population. Results are expected in 2006.

Most lake sturgeon target a primary, deeper stretch of the river to spend the summer months. As water temperatures cool in the fall, they disperse throughout the river, eventually selecting a secondary deeper stretch to spend the winter. There isn't much movement throughout the coldest winter months. However, when water temperatures approach 50 degrees Fahrenheit, usually around the end of March, lake sturgeon make a mass migration upstream.

Most make it to Williams Dam, which provides a barrier to further upstream movement. After spending several weeks in the Williams Dam area, all slowly swim back downstream, with most returning to their primary summer reach of the river.

Anyone who catches a lake sturgeon should return it to the river immediately.

Statewide freshwater mussel survey

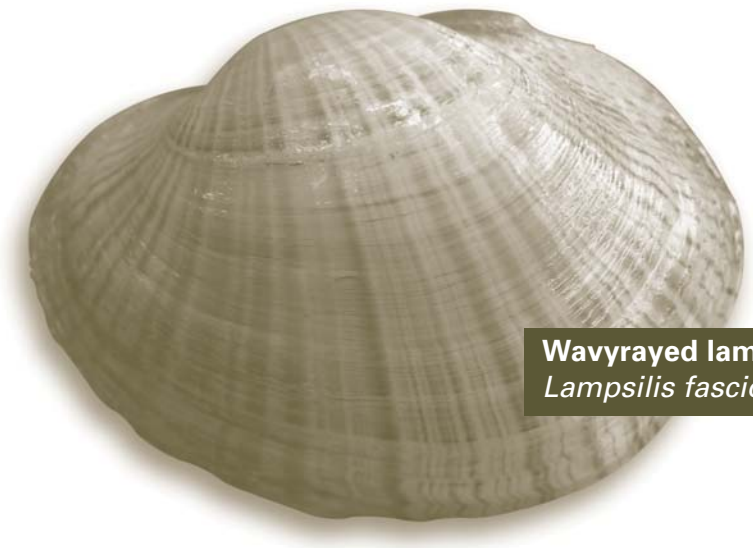
In 2005, mussel surveys were completed in the following drainages: Otter Creek (Vigo County), Laughery Creek (Ohio,

Ripley), Hogan Creek (Dearborn), Tanners Creek (Dearborn), Yellow River (Marshall), Vermillion River (Vermillion), Eel River (Clay, Owen, Greene), Big Raccoon Creek (Parke), Little Wabash River (Allen, Huntington), Rock Creek (Huntington, Wells), Indian-Kentuck Creek (Jefferson), Pipe Creek (Cass, Miami), Big Creek (Posey), Deer Creek (Carroll, Cass), Big Pine Creek (Warren, Benton), Anderson River (Perry, Spencer), Little Pigeon Creek (Warrick, Spencer) and Wea Creek (Tippecanoe).

Notable finds in 2005:
Although no live individuals were found, fresh shells of the fat pocketbook *(Potamilus capax)*, an endangered species on federal and state lists, were found at several locations in Big Creek in Posey County. This species previously was known to occur in the lower Wabash and White rivers. Several new populations of the kidneyshell *(Ptychobranchus fasciolaris)* and wavyrayed lampmussel *(Lampsilis fasciola)*, state species of special concern, were discovered in multiple drainages. Diverse mussel communities were documented in stretches of Big Pine, Deer and Laughery creeks.

Mussel survey background:
The Wildlife Diversity Section has funded freshwater mussel surveys of most of Indiana's major drainages since 1990. These surveys provide valuable information on current and historical freshwater mussel distribution of Indiana. However, many Indiana streams remained unsurveyed; no information was available on the current freshwater mussel community of these areas.

Kidneyshell
Ptychobranchus fasciolaris



Wavyrayed lampmussel
Lampsilis fasciola

Fat Pocketbook
Potamilus capax

(WDS staff/IDNR)

A statewide survey of previously unsurveyed streams began in 2001; WDS biologists have sampled nearly 400 sites to date. Several important locations for new species were documented during the first years of the study:

- *A previously unknown reproducing population of the snuffbox* (Epioblasma triquetra)*, a state-endangered species, was found in the Salamonie River.*
- *Reproducing round hickorynut* (Obovaria subrotunda)*, a state species of special concern, were found in the West Fork White River drainage.*
- *Little spectaclecase* (Villosa lienosa)*, another special concern species, were found to have a much larger distribution than previously known.*
- *Large, reproducing populations of ellipse* (Venustaconcha ellipsiformis)*, also a state species of special concern, were located at several locations in the Kankakee and Lake Michigan drainages.*

Next steps: The statewide mussel survey will continue through the summer of 2006.

Mussel aches: A life down under

No other country in the world equals the United States in freshwater mussel diversity. While Europe supports only 12 species, nearly 300 kinds live in the United States; 77 are native to Indiana.

Unfortunately, these mollusks are one of the most troubled natural resources in this country. It is estimated that 70 percent of our freshwater mussels are extinct, endangered or in need of special protection.

Top threats: Although water quality has improved in some areas, pollution (from point and non-point sources) is a great threat to native mussels. Sedimentation, which clogs their gills, takes a serious toll. They continue to lose habitat through channelization, clearing streambanks of vegetation and dredging.

Invasive zebra mussels also are a big problem. Zebra mussels reproduce at a tremendous rate and can completely cover native mussels and their habitats. Competition for food and oxygen weakens and eventually starves native mussels.

Their valuable role: In rivers and lakes where mussels live on the bottom, their filtering ability makes them natural water purifiers. Mussels play an important role in the aquatic food chain as a food source for wildlife including muskrats and otters.

Mussels also can tell us something about the health of the environment. Mussels respond to changes in water quality. Gradual mussel die-offs or sudden mussel kills are reliable indicators of water pollution problems and other environmental health concerns. Stable, diverse mussel populations generally indicate clean water and a healthy aquatic environment.

Regulations: It is illegal to collect or take live or dead mussel shells from public waters. A ban on harvesting shells has been in effect since 1991 to protect against the rapid decrease in the abundance and distribution of mussels.

Birds

By John Castrale, avian biologist

Bald eagle (U.S. Fish and Wildlife Service)

There are more than 300 species of nongame birds in Indiana, so WDS bird projects are very diverse and include inventory and surveys, monitoring, research, management, species restoration and technical guidance. Some highlights from 2005 follow.

Bald eagle populations still flying high

Bald eagles *(Haliaeetus leucocephalus)* continue to make a strong comeback in Indiana!

Midwinter Eagle Survey: In January 2005, 187 bald eagles were tallied during the Midwinter Eagle Survey. This is well above the 10-year average of 157 and the third highest count ever. During the three days of the survey, biologists conducted flights on 15 lakes and over 650 miles of rivers. Weather conditions were mild prior to the survey, allowing birds to remain farther north in

Indiana's bald eagle program

The bald eagle project was the DNR's first endangered species restoration project. During five years starting in 1989, biologists released 73 bald eagle chicks at Monroe Reservoir in Monroe County.

When reaching adulthood at four to five years of age, bald eagles return to nest within 50 to 100 miles of where they fledged. Indiana's first successful bald eagle nest since 1897 was at Lake Monroe in 1991. Loss of habitat and decreased reproduction due to pesticides such as DDT contributed to the bald eagle's disappearance from Indiana.

Biologists monitor bald eagle nesting every year to determine nest success and number of chicks produced. The number of nesting territories continues to steadily increase. In 2005, 62 eagles nested on rivers, lakes and reservoirs throughout the southern half of Indiana and up the Wabash River to Cass and Wabash counties. At least 463 eaglets have fledged from Indiana nests through 2005.

the upper Midwest. Ice-free waterways resulted in a slightly above average concentration of eagles on lakes and reservoirs compared to rivers. Extensive flooding along rivers likely resulted in some undercounting. Sixty-six percent of eagles observed were adults, just above the 10-year mean of 63 percent.

Nesting info: Overall breeding records were broken again in 2005, with 47 of 62 active nests successfully producing 87 young (1.4 eaglets fledged per active nest). In 2004, 44 of 50 active nests produced 85 young.

Bald eagle nesting in Indiana

	Nesting territories	Nesting attempts	Successful nests	Young fledged
1989	2	1	0	0
1990	2	1	0	0
1991	5	3	2	3
1992	10	5	3	5
1993	12	9	4	7
1994	12	11	4	7
1995	15	13	11	17
1996	17	15	12	17
1997	18	15	9	13
1998	19	15	11	20
1999	21	20	12	19
2000	24	23	16	35
2001	31	20	21	40
2002	38	38	26	45
2003	47	45	33	63
2004	57	50	44	85
2005	64	62	47	87

Wildlife Diversity Section staff monitored 68 nest structures or territories in 33 counties. Nine nests were active for the first time, while six active pairs from 2004 did not nest this year. The overall breeding range expanded to the east with new nests in Wabash and Union counties. Single eaglets were raised at 13 nests, twins at 28 nests and triplets in six nests.

Eagles considered for delisting: When the eagle project started, biologists set a recovery goal of 50 active pairs for three consecutive years. After 16 years of hard work, bald eagle numbers have now exceeded this goal. During 2006, the Nongame Bird Technical Avisory Committee will consider delisting bald eagles in Indiana. The U.S. Fish and Wildlife Service is also moving closer to delisting bald eagles at the federal level. Everyone who contributed to the Nongame Fund should take great pride in the part they played to bring our national symbol back home again in Indiana.

Bald eagle chicks (U.S. Fish and Wildlife Service)

Peregrine falcons reach record 12 pairs

Peregrine falcons *(Falco peregrinus)* have reached a record of 12 pairs in Indiana in 2005, after the re-discovery of a pair in Indianapolis that relocated 1.3 miles from its previous nest site but was not found last year. Nine of the 12 nesting attempts were successful, and 29 chicks fledged this season. Biologists banded all but four of the chicks.

Two pairs of falcons nested in Indianapolis, with one pair each in Fort Wayne, South Bend, and at a power plant in Jasper County. Seven nests were recorded at industrial sites (steel mills, power plants, a highway bridge and an oil refinery) along Lake Michigan. All but three nesting adults were identified, and turnover (falcons replaced by others) was noted in four instances, including at U.S. Steel in Gary where the resident male was likely killed by his grandson.

Peregrine facts

The peregrine falcon is found on every continent except Antarctica. Peregrine populations exhibited large-scale declines throughout the world in the mid-1900s primarily because DDT and other pesticide contamination affected nesting success.

Peregrine falcon (U.S. Fish and Wildlife Service)

Here are some other falcon facts for 2005:

- *At a bridge in East Chicago, two nests were within 1/4-mile of each other and the new unbanded male appears to be paired with both females.*
- *At Bethlehem Steel, a pair re-nested after chicks from the first nesting attempt died and they fledged two chicks in mid-August (the latest date on record in the Midwest).*
- *Two injured falcons required rehabilitation and were released.*
- *During 2005, identified falcons had origins in Wisconsin (five birds), Indiana (four), Missouri (three), Illinois (two), and one bird each in Iowa, Kentucky, Michigan and Ohio. (Biologists determine origin from leg bands.) In addition, seven other peregrines with Indiana origins were known to be nesting (two each in Illinois, Iowa and Wisconsin; one in Ohio).*
- *Biologists built a new nest box in Indianapolis; the previous box had been removed due to building construction.*

In 1972, U.S. Fish and Wildlife Service listed the peregrine falcon in North America as an endangered species. Due to reductions of DDT, reproductive success improved and populations began increasing. However, the Eastern U.S. population had totally disappeared. During the 1970s, programs began to restore peregrine populations by releasing young captive-bred birds in urban areas where skyscrapers mimicked natural suitable habitats. These efforts have been successful, and peregrines once again nest in the East and Midwest.

The Indiana peregrine falcon reintroduction project began in 1991 with the release of 15 young birds in Indianapolis. Over the next three years, releases occurred in Fort Wayne, South Bend and Evansville. A total of 60 young peregrine falcons have been released in the state.

Although peregrines are still considered endangered in Indiana, it is likely that we have more of them in the state today that we had prior to European settlement. Indiana's efforts have contributed greatly to the national recovery effort. In August 1999, peregrine falcons were removed from the federal endangered species list, meaning that populations are viable nationwide. In the near future, the state will consider removing peregrines from Indiana's endangered species list as well.

A "tern" for the better at Gibson Lake

In 2005, interior least terns *(Sterna antillarum)* experienced the second highest level of recorded nesting success at Gibson Lake and the adjacent Cane Ridge Wildlife Management Area in Gibson County. Predation was extremely low compared to previous years.

Thirty of 40 tern nests are believed successful, and 57 chicks fledged. This relative productivity (1.4 chicks fledged per nesting attempt) has not been this high since 1998. Five tern nests were at the tip of Gibson Lake's center dike, and 35 nests were at Cane Ridge WMA. The only episodes of predation were thought to have been caused by a great horned owl.

Interior least tern
(U.S. Fish and Wildlife Service)

Interior least terns, a state and federal endangered species, have nested at Gibson Lake beginning in 1986; at least 25 pairs have nested there annually since 1996. In recent years, high predation on eggs and chicks, primarily by ring-billed gulls, has resulted in dismal production. However, the creation of fenced nesting islands at Cane Ridge WMA offered terns a relatively safe place to nest in 2005.

Gibson Lake and Cane Ridge WMA support one of the few known interior least tern nesting colonies east of the Mississippi River. Gibson Lake is a 3,000-acre cooling reservoir owned and operated by Cinergy's Gibson Generating Station. Cane Ridge WMA is a 440-acre unit of the nearby Patoka River National Wildlife Refuge. The property was a cooperative restoration effort between the U.S. Fish and Wildlife Service and Cinergy's Habitat Conservation Program to relocate a least tern colony from part of Gibson Generating Station.

Least tern news

- **U.S. Fish and Wildlife Service biologists will complete construction of another nesting island at Cane Ridge WMA in 2006.**
- **The DNR plans to build a nesting island at nearby Tern Bar Slough Wildlife Diversity Area (840 acres), and will also restore wetlands.**
- **Nesting by least terns was noted along the Wabash River near Grayville, Illinois, and at a dredge island in the Ohio River near Grandview, Indiana. Nesting took place at a power plant near this latter site in 2003. Although rising water threatened this site, chicks were noted, but it was uncertain how many fledged.**

Osprey reproduction is up; 32 birds released

Osprey *(Pandion haliaetus)* nestlings were released for the third consecutive year at Patoka Lake and Tri-County Fish and Wildlife Area (Orange and Kosciusko counties, respectively). Nestlings were released for the second year at Jasper-Pulaski and Minnehaha FWAs (Jasper and Sullivan counties, respectively).

WDS staff obtained 32 osprey nestlings from the Chesapeake Bay of Virginia and transported them to Indiana in late June 2005. All birds were released in July. Biologists provided fish at hack sites until late August to give the birds a helping hand. Individual birds were last seen from two to 43 days after initial flights. No birds are known to have died.

The only sightings away from release sites were three birds seen together at Minnehaha FWA; biologists believe these birds dispersed from Jasper-Pulaski FWA. Single birds from the 2003 releases returned to Tri-County FWA and Patoka Lake but did not nest. A newly established nesting pair harassed a released osprey at Tri-County FWA.

Eleven (compared to eight in 2004) active nests were found throughout Indiana. Two each were located [counties in parentheses] at Brookville Reservoir (Union, Franklin), Potato Creek State Park (St. Joseph) and Pigeon River FWA (LaGrange) and on Patoka Lake (Orange). Single nests were located at Hovey Lake FWA (Posey) and Tri-County FWA, and on the Kankakee River (LaPorte). Ospreys raised 23 nestlings successfully at 10 sites. All nests were on nest platforms or utility poles except for two nests in dead trees. Three adults at these nests had leg bands indicating their origins in Ohio, Minnesota and Pennsylvania.

Contacts were made to erect additional nesting platforms in suitable habitat areas. Dubois County Rural Electric Cooperative, Indiana American Water Company, Cinergy and Bectren have agreed to donate utility poles and assist in erecting platforms.

Like peregrine falcons, ospreys are found on every continent except Antarctica. The population declined rapidly between 1950 and 1980 due to DDT, loss of breeding grounds and poaching. The banning of DDT in combination with state conservation programs has allowed osprey populations to surge throughout the U.S. The osprey is listed as endangered in Indiana.

Sandhills and whoopers just passing through

Sandhills: During the coordinated fall census in November 2004, biologists counted 11,000 sandhill cranes *(Grus canadensis)* at Jasper-Pulaski Fish and Wildlife Area and 500 at Pigeon

Sandhill crane (U.S. Fish and Wildlife Service)

River FWA (Jasper and LaGrange counties, respectively). The peak fall population of staging sandhill cranes at Jasper-Pulaski FWA was 24,162 on November 23. In late December, 13,000 were still present. These numbers indicate that the eastern population of sandhill cranes is healthy and more are wintering in the area.

The largest concentration of sandhills in the Eastern U.S. occurs at Jasper-Pulaski FWA. From October through November, sandhills from Minnesota, Wisconsin, Michigan and Ontario stop here during migration. More than 30,000 sandhills have gathered here in early to mid-November during the peak of migration. While hunted in some states, sandhills are protected in Indiana.

Whoopers: The Whooping Crane Eastern Partnership, an international coalition of public and private organizations, coordinates an ultralight-led reintroduction project to return this federally endangered species to its historic range in eastern North America. Ultralights are used to teach young birds their annual migration path. The birds pass through Indiana each year on their trek. WDS staff help monitor the cranes' journey through the state.

During the fourth year of the project, 14 captive-bred whooping cranes *(Grus americana)* were lead by ultralight aircraft on October 10, 2004, from Necedah National Wildlife Refuge in central Wisconsin and arrived on December 12 at the wintering site at Chassowitzka NWR on the Gulf Coast of Florida. The 19 days of flight was similar to that of previous years, but weather delays greatly increased the overall migration period.

The Indiana leg of the project lasted from November 5 to 14 with the ultralight and cranes making stops in Boone, Morgan, Jennings and Scott counties. Twenty-two cranes from previous releases made stops in Indiana while migrating from Wisconsin to Florida. They migrated singly

Young whooping cranes follow an ultralight from Wisconsin to Florida. (U.S. Fish and Wildlife Service)

or in groups of up to three birds and were in Indiana from November 6 through December 18. Most were present for two to four days although two groups stayed 20 and 27 days, respectively. At least three groups were detected in Indiana while migrating northward during March 2005.

How many whoopers?

Currently, there are only about 300 whoopers in the wild. Aside from the ultralight-trained cranes, the only migrating population nests at the Wood Buffalo National Park in Canada and winters at the Aransas NWR on the Texas Gulf Coast. A non-migrating flock of approximately 90 birds lives year-round in central Florida near Kissimmee.

Whooping cranes are the largest wading bird species in North America, standing up to five feet tall with a wingspan of seven feet.

Barn owl (U.S. Fish and Wildlfie Service)

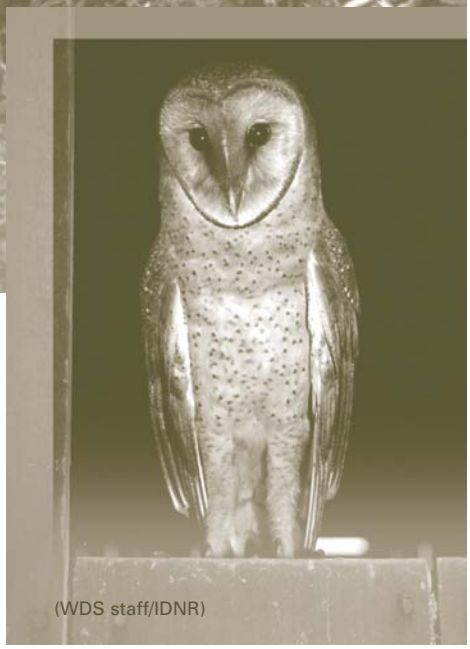
Barn owls at record number of sites

Barn owls *(Tyto alba)* nested in a record 18 nesting sites in 2005, surpassing the previous record of 15 nests.

During 2005, biologists checked 162 intact nesting boxes in 43 counties to uncover this new record. The nesting sites featured the following: single adults (five sites), adult pairs (two sites), nests with eggs (two sites) and nests with young (nine sites). All were in nest boxes in wooden barns except for one in a corn crib and another in a large metal storage building with open sides.

Since 1983, the Wildlife Diversity Section has erected more than 200 nest boxes for barn owls in grassland habitats throughout Indiana, primarily in the southern part of the state. A database of these locations is maintained, and boxes are checked for use each year.

Other species using barn owl boxes were rock pigeons, American kestrels, European starlings, raccoons and squirrels. Twenty-two boxes were absent or could not be located since 2004, primarily as a result of wooden barns falling into disrepair or being replaced. Barn owl boxes were installed at two new sites.



(WDS staff/IDNR)

The barn owl is the most widely distributed of all owls in the world. Ill-equipped for cold weather, barn owls mostly occur in counties along the Ohio River. In Indiana and many other Midwestern states, this once-common rural inhabitant is now rare mainly due to changes in agricultural habitat and loss of barn structures. The species is considered endangered in Indiana.

Can you help a barn owl find a home?

WDS biologists are always looking for suitable areas to erect barn owl nest boxes. Primary considerations are the presence of suitable foraging areas (pastures, hayfields, permanent grasslands and marshes) and large wooden barns or other structures where a nest box can be placed. If you own property that might meet this description and would be willing to host a barn owl nest box, please contact biologist John Castrale (812-849-4586).

Breeding Bird Atlas of Indiana

The Breeding Bird Atlas is a comprehensive, statewide survey that reveals the current distribution of breeding birds in Indiana. It was conducted in Indiana during 1985 to 1990, and this project was restarted in 2005 to gather new information.

Volunteers and biologists are visiting 647 priority blocks to obtain evidence of breeding. Since 2005 was the first year of fieldwork, results have not been determined. Data entry takes place online at the Breeding Bird Atlas Explorer, a cooperative effort with the Patuxent Wildlife Research Center and National Biological Information Infrastructure. Field forms, maps and instructions were developed and distributed to atlas participants; county coordinators were recruited to find additional participants and facilitate atlasing.

WDS biologist John Castrale continues to serve as state co-coordinator for the Breeding Bird Atlas to maintain adequate geographic coverage and identify qualified volunteers to carry out this important monitoring effort.

Audubon IMPORTANT BIRD AREAS

Nongame bird conservation initiatives

The Wildlife Diversity Section continued its active participation in national and international bird conservation initiatives in 2005, including Partners In Flight, U.S. Shorebird Conservation Plan, North American Waterbird Conservation Plan, and North American Waterfowl Management Plan.

In addition, biologist John Castrale represents Indiana on the Scientific Technical Committee for the Upper Mississippi River/Great Lakes Joint Venture. The committee advises the Management Board, reviews research proposals for funding consideration, and is updating the JV's North American Waterfowl Management Plan to encompass all bird conservation. Originally charged with forming partnerships to develop habitat projects for waterfowl, the Joint Venture has expanded these efforts to include projects to conserve shorebirds, other waterbirds, and upland birds.

In 2005, National Audubon Society hired James Cole (jcole@audubon.org) as coordinator of the Important Bird Areas program in Indiana. An IBA is designated as globally important habitat for the conservation of bird populations. Many of these sites are owned or managed by state and federal agencies. WDS biologist John Castrale serves on an advisory board in this effort to set criteria and identify potential IBAs. Once identified, IBAs offer conservation opportunities for citizens in monitoring, local stewardship and advocacy. Thirteen IBAs have now been designated in Indiana and others are being considered (see www.indianaaudubon.org/IBA/IBA.htm).

Mammals

By Scott Johnson, mammal biologist

Nongame and endangered mammals include a variety of interesting and charismatic species ranging from highly mobile bobcats and otters to more sedentary Franklin's ground squirrels and Allegheny woodrats. Perhaps because people live so closely with mammals such as dogs, cats, horses and cattle, people feel an instinctive connection to mammals, and interest in this group is always high.

Indiana bat (U.S. Fish and Wildlife Service)

Changes in administrative rules and state listings

Recommended downlisting southeastern bat: In December 2004, the Nongame Mammal Technical Advisory Committee recommended changing the status of the southeastern myotis *(Myotis austroriparius)* — commonly referred to as the southeastern bat — from state endangered to species of special concern.

The species reaches the northern limit of its range in extreme southern Indiana and Illinois and has not been recorded from the state since 1977. The committee believes the southeastern myotis is of accidental occurrence in Indiana and is therefore best represented as a species of special concern rather than an endangered resident species.

Officially changing the status begins with recommendations provided by the Technical Advisory Committee. All status changes then go through the division's administrative rule process.

De-listing bobcats, badgers and otters: in July 2005, bobcats, badgers and river otters were removed from Indiana's endangered species list and reclassified as protected nongame. As protected nongame, these species cannot be taken from the wild, and private citizens cannot possess their carcasses or hides if obtained from accidental captures.

All three were included on Indiana's original endangered species list published in 1969, but recent studies have shown increasing populations of these furbearers. Delisting occurred through an emergency rule. Permanent rule approval is expected from the Natural Resources Commission in 2006.

Record number of Indiana bats counted

Biologists complete a census of winter hibernacula for the feder-

Managing Indiana bat winter hibernacula

Wildlife Diversity personnel use several strategies to manage important winter hibernacula for the federally endangered Indiana bat *(Myotis sodalis)*. They also assess the efficacy of different protection measures:

- **"Indiana Bat Hibernating Colony" warning signs, which define the seasonal closure period from September 1 to April 30, are posted at 11 caves in southern Indiana. (Caves supporting hibernating Indiana bats may not be legally entered between September 1 and April 30.)**
- **Remote electronic alarm systems, first deployed in 1996, continue to be effective deterrents to unauthorized visitations in three hibernacula.**
- **2004 to 2005 winter was the seventh consecutive hibernating season in which no visitations were noted in Coon Cave. Additionally, no visitations were detected in either Ray's (for the third consecutive winter) or Grotto (for the eighth consecutive winter) caves. For the second consecutive winter, Saltpeter Cave experienced only one unauthorized trip.**
- **Other management activities include landowner outreach, sign and gate maintenance and use of dataloggers to monitor roost temperatures in select hibernacula.**

Indiana bat colony (WDS staff/IDNR)

ally endangered Indiana bat *(Myotis sodalis)* every two years in Indiana. The goal is to monitor the species' status and assess progress towards recovery. Biologists surveyed the Indiana bat again in 2005.

Increases: In January and February 2005, 206,610 Indiana bats were counted in 25 of 27 caves visited. This represents a 13 percent increase (23,307 bats) from the 2003 count — the highest ever recorded in the state. Nearly 55,000 bats were counted in Wyandotte Cave, an astounding 76 percent increase from 2003, making it the largest known hibernacula in the state. Ray's Cave contained 54,325 bats (7 percent increase), and Jug Hole harbored 29,430 bats (53 percent increase), which nearly qualifies it as Indiana's fifth "Priority 1" hibernacula (a cave harboring more than 30,000 bats). Smaller populations at Clyfty, Endless, Saltpeter and Wallier caves had increases totaling 815 bats.

Declines: In contrast, Indiana's two original "Priority 1" hibernacula both continue long-term declines. Twin Domes Cave had 36,800 bats, a 25 percent drop from 2003 and nearly one-third of its population (98,250) in 1981. Batwing Cave remained essentially unchanged (6,850 in 2005; 6,900 in 2003) but still less than one-fourth of its previous high (29,960) in 1981. Slight declines were noted in Grotto (9,875) and Coon (9,270) caves; however, both are still near record highs established in 2003.

Losses were reported at Parker's Pit and Robinson's Ladder, Sexton Springs, Mitchell Crushed Stone Quarry, Gypsy Bill Allen, Saltpeter, Leonard Springs and Buckner's caves.

New populations: Two new small populations with fewer than 30 bats were found in Storms Pit and Sullivan Cave.

Franklin's ground squirrel populations patchy

Franklin's ground squirrels *(Spermophilus frankinii)* occupy tall grasslands, forest-prairie borders and marsh edges in 10 states and four Canadian provinces in the central and north-central Great Plains region of North America. They are uncommon to rare in Indiana and historically have been recorded in 16 contiguous counties in the northwest corner of the state.

Franklin's ground squirrel trapped as part of population study (WDS staff/IDNR)

Surveys by Wildlife Diversity Section personnel since the mid-1980s documented a steady reduction in distribution with only eight occupied sites found during the last survey in 1994. Most populations were patchy in distribution. They were found along linear railroad rights of way in Benton and Tippecanoe counties or within isolated prairie/grassland preserves in Lake County.

In 2005, WDS staff began to revisit these and other potential sites to reassess the status, distribution and relative abundance of Franklin's ground squirrels in Indiana. Biologists trapped the species at 13 sites on railroad rights of way in Benton and Tippecanoe counties from mid-May to early August 2005. Twenty-eight squirrels (11 males, 15 females, two unknown) were captured at seven sites, all in Benton County.

Currently, population trends are not available, but by comparing 2005 captures sites to those in previous surveys, biologists believe that populations on railroad rights of way have discontinuous distribution; small colonies might be transitory or nomadic. Surveys will resume in spring 2006 focusing on railroad sites and nature preserves in Lake, Newton and Warren counties.

Allegheny woodrats continue to decline

DNR has listed Allegheny woodrats *(Neotoma magister)* as state-endangered since 1984. They are rare, and Indiana's current population is limited to the limestone cliffs bordering the Ohio River in extreme south-central Indiana.

Biologists revisited known population sites in 2005 to monitor changes in the species' status, distribution and relative abundance. Fifty-one woodrats (27 males, 24 females) were captured 82 times at only seven sites. Compared to 2002, when 81 woodrats were captured, this represents a 37 percent decline in captures and the fewest woodrats found in Indiana in 14 years.

No woodrats were found at three sites (two bluffs, one cave), and population declines were evident at five of the seven occupied bluff sites. Only one site yielded more than 10 individuals. Although nearly all populations in Indiana have declined since 1991, Allegheny woodrats persist at Bull's Point Bluff (Crawford County), Harrison-Crawford State Forest in the namesake counties, Tobacco Landing (Harrison County) and Rabbit Hash Ridge (Harrison County).

Population genetics of Allegheny woodrats

In 2005, the Wildlife Diversity Section entered into a contractual agreement with Purdue University's Department of Forestry and Natural Resources. Dr. O.E. Rhodes and researchers will assess Allegheny woodrat populations *(Neotoma magister)* in Indiana. Specifically, they will:

- **assess woodrats' population genetics**
- **determine the woodrats' long-term viability**
- **assess the potential of conservation measures.**

Researchers will measure levels of genetic variation within Indiana's woodrat population. In addition, they will evaluate whether loss of genetic diversity is a factor contributing to the species' risk of extirpation. Researchers also will compare Indiana's woodrats to populations throughout its geographic range.

In endangered species conservation, biologists are interested in genetic variation — meaning the level or amount of diversity in a population's genetic makeup. Genetic diversity is beneficial, and populations with high levels of diversity have better chances of surviving a disease outbreak or other problem that could impact a population.

Researchers will assess exposure of Indiana woodrats to raccoon roundworm. They also will examine the utility of using DNA obtained from fecal pellets to estimate genetic diversity, population size, dispersal and movement parameters, and productivity through parentage analyses. Field work began in summer 2005 with tissue and fecal samples obtained from woodrats captured during routine status surveys.

Gaining knowledge about population genetics might point the way to management strategies that will maintain Indiana's woodrat populations.

Allegheny woodrat (WDS staff/IDNR)

River otters removed from state-endangered status

Due to surges in river otter populations, the species *(Lontra canadensis)* was reclassified in Indiana from state-endangered to protected nongame in July 2005. This means that while otters are protected from harvest or other uses, their populations are increasingly healthy and more viable. This is a huge success for Indiana's otters!

Restoration measures: Historically, Indiana's native river otter population declined sharply through the early 1900s due to unregulated harvest and habitat loss; the species was extirpated from the state by 1942. To restore otters to portions of their historic range, 303 otters (184 males, 119 females) were safely trapped in Louisiana using modified foothold traps and released at 12 sites in six Indiana watersheds (Muscatatuck, Patoka, South-central Ohio, St. Joseph, Tippecanoe, Upper Wabash rivers) between 1995 and 1999.

Mortality factors: To date, 58 (42 males, 16 females) of these otters (19 percent) are known to have died, most in traps legally set for other furbearers and from collisions with vehicles.

The types and levels of major sources of mortality (trap-related and road-kills) were expected and are within reason. Mortality factors have not prevented otters from becoming established in those watersheds that were targeted for restoration.

Trappers' assistance: Trappers have been very supportive of the otter reintroduction program and have taken steps to reduce the likelihood of accidentally trapping otters. In addition, trappers have turned in otters that were accidentally trapped, which has provided much information (distribution, age, reproductive parameters).

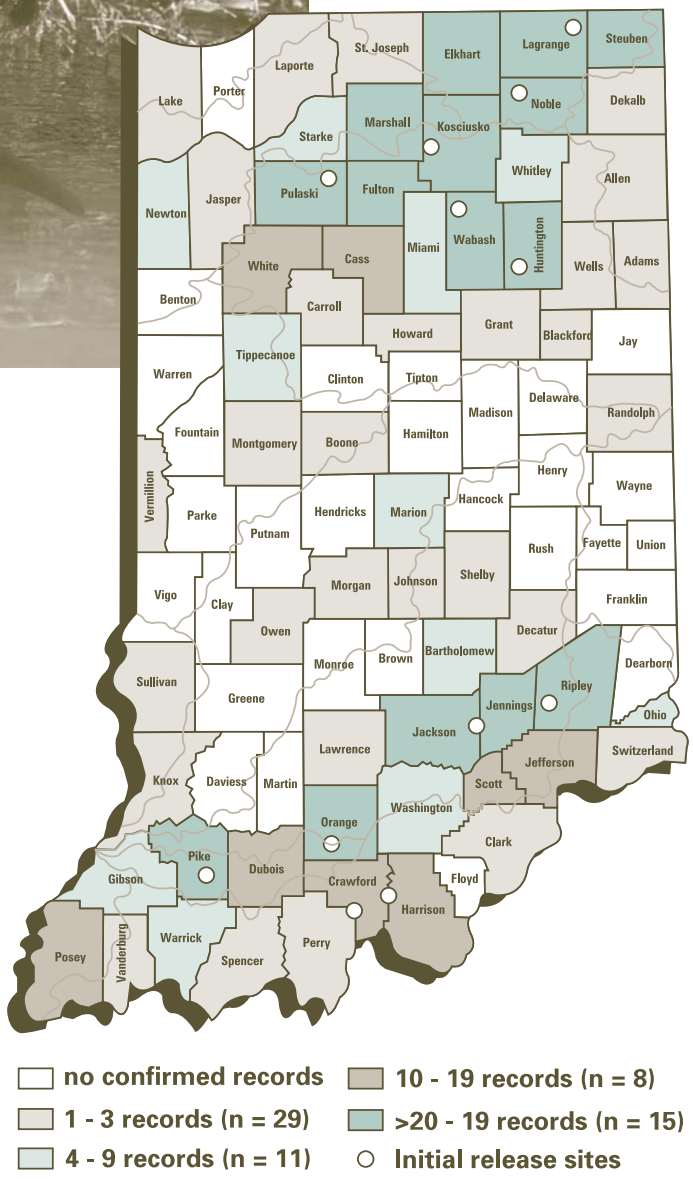
release sites. They are rare or were not reported in 58 counties in central Indiana.

Reproduction was confirmed, either by recovery of untagged individuals and/or observations of family groups, every year except 1995 and at 10 of 12 release sites. Pregnancy rates for Indiana otters were 86 percent and 53 percent for adults and yearlings, respectively, with an average litter size of 2.5 pups.

Future goals: Biologists have their sights set on defining otters' statewide geographic distribution and improving management strategies to protect, maintain and regulate restored populations.

River otters (U.S. Fish and Wildlife Service)

2005 otter populations by county



Population expansion: Since the otter reintroduction effort began in 1995, Indiana biologists have used field surveys, sightings and information from mortalities to assess where otters live and how they are expanding geographically. During this 10-year period, otters were reported from 63 of 92 counties and 14 of 15 watersheds in Indiana. They occupy all 12 release sites, have expanded to adjacent habitats and colonized drainages not originally targeted for restoration.

Otters are widely distributed in northeast, north-central and southern Indiana but are most common in 23 contiguous counties surrounding the 12 original

Bobcats in other parts of Indiana

In addition to the radio-telemetry study, Wildlife Diversity Section personnel seek information about the status, distribution and relative abundance of bobcats *(Lynx rufus)* in other parts of the Hoosier state.

Excluding individuals captured or sighted as part of the radio-telemetry study, there have been 105 confirmed reports (road-kills, accidental captures) from 35 Indiana counties since 1970. Seventy-five reports (71 percent) have occurred in the last five years. Most are in the southwest and south-central Indiana with fewer reports scattered throughout the southeast, west-central, north-central, and northeast regions of the state. The database also contains information on 323 unconfirmed reports from 76 Indiana counties. In 2005, the database was instrumental in providing justification to reclassify bobcats in Indiana from endangered to protected nongame.

Ecology of bobcats in south-central Indiana

As a 7-year bobcat radio-telemetry study winds down, Wildlife Diversity Section personnel are learning critical information about the habits and biology of bobcats *(Lynx rufus)* in the Hoosier state. Such studies will help biologists better understand and manage this protected species. The bobcat was removed from Indiana's endangered species list in 2005. This study documented that these secretive animals are not in jeopardy of being expirated from Indiana.

Background: In December 1998, WDS personnel initiated a multi-year study to obtain basic ecological information about bobcats from an established population in Indiana.

At that time, bobcats were still listed as endangered, but biologists had already begun to see a dramatic increase in the number of cats that were reported struck by vehicles or accidentally captured by trappers. Was this indicative of a true population increase, greater public awareness, or a combination of both? What are the movement patterns and habitat needs for Indiana bobcats? Do they differ between males and females? What are their major sources of mortality? Do juveniles move away from their natal areas to establish their own territories? If so, when do they disperse and where do they go? Such answers are not easily obtained for an animal as elusive and wide-ranging as a bobcat without a commitment to long-term, comprehensive investigation.

The study site was near Springville in northwest Lawrence County, an area known to support bobcats based on the number of recent road-kills and accidental captures. Biologists used cage traps and padded foothold traps to capture bobcats unharmed and then attached radio collars to follow their movements and activities. The idea was to let radioed bobcats dictate the size and shape of the study area.

A bobcat captured during the radio-telemetry study (WDS staff/IDNR)

43 bobcats trapped: During seven winter trapping sessions, biologists captured 43 different bobcats (27 males, 16 females) in portions of Greene, Lawrence and Martin counties. Biologists captured 21 adults, 19 juveniles and three kittens. They recorded body size, tooth wear and reproductive condition that indicate age. Biologists affixed radio collars to 38 bobcats (25 males, 13 females) and followed each cat's movements and activities for an average of 1.5 years.

Mortality factors: Seventeen of the 38 radioed bobcats died during the time of the study, and as expected, human-related factors have been principal sources of mortality. Nine cats were struck by vehicles, three were shot, and four died from unknown causes. Only one young adult male died from natural causes: head injuries and associated infections presumably inflicted during a conflict with another predator.

An aide places ointment in a bobcat's eyes to protect its vision, since the animal doesn't blink when sedated. (WDS staff/IDNR)

Several adult males, including the first bobcat captured, have worn four different collars and were monitored for four to five years. The core study area has since expanded to include portions of Crane Naval Support Weapons Center, Martin State Forest, Hoosier National Forest and private properties throughout eight contiguous counties in south-central Indiana.

Long-range travelers: Most fascinating is the dispersal behavior of juvenile bobcats as they seek to establish territories that they will occupy as breeding adults. The maximum linear distance traveled by 12 radioed males has averaged nearly 100 miles, including four cats that were subsequently recovered in western Illinois, northern Kentucky, as well as Cincinnati, Ohio, and Lansing, Michigan. In contrast, five juvenile females have moved only an average of six miles from their capture site before entering their first breeding season.

Home range analyses are ongoing; so far, the annual home range size of an established, resident adult male averages about 30 square miles, while that of an adult female averages 16 square miles.

Next steps: Biologists will continue monitoring the six remaining radioed bobcats, including three dispersing males, through spring 2006 before resuming more detailed analyses of home range, survival and habitats used by Indiana bobcats.

Information Resources

Want to know more about nongame and endangered species? Look here!

Web resources

Indiana Department of Natural Resources: www.in.gov/dnr

Indiana Division of Fish and Wildlife: www.in.gov/dnr/fishwild

Indiana Wildlife Diversity Section: www.in.gov/dnr/fish-wild/endangered

Indiana's reptiles and amphibians

In 2001 the DNR and Purdue University published "Snakes of Indiana." Some proceeds from the sale of this book go directly to the Nongame Fund. You can call the DNR Information Center to order a copy at (877) 463-6367.

Biologist scientific reports

Our biologists contributed to several scientific publications in 2005. These include:

Brack, V., Jr., J.A. Duffey, R.K. Dunlap, and S.A. Johnson. 2005. Flooding of hibernacula in Indiana: are some caves population sinks? Bat Research News 46:71-74.

Brack, V., Jr., R.K. Dunlap, and S.A. Johnson. 2005. Albinism in the Indiana bat, Myotis sodalis. Bat Research News 46:55-58.

Walker, Z. W., N. E. Engbrecht, A. J. Berger, and M. J. Lodato. 2005. Geographic Distribution: Notophthalmus viridescens louisianensis. SSAR Herp Review 36(1):72

Walker, Z. W. and B. Fisher. 2005. Geographic Distribution: Pseudemys concinna. SSAR Herp Review 36(1):78

Walker, Z. W. and G. Deichsel. 2005. Geographic Distribution: Podarcis muralis. SSAR Herp Review 36(2):202

Tordoff, H.B., J.A. Goggin, and J.S. Castrale. 2004. Midwest peregrine falcon restoration, 2004 report.

More herps info from Purdue

Our herpetologist, Zack Walker, has collaborated with Purdue to produce more books like "Snakes of Indiana." "Turtles of Indiana" was published in 2005, "Salamanders of Indiana" is expected in 2006, and "Frogs and Toads of Indiana" should be published in 2007. For more information call Purdue Extension at 888-EXT-INFO (1-888-398-4636).

Meet the WDS Staff

The Wildlife Diversity Section is a small, hearty and hardworking crew. Learn about the biologists and staff who collectively manage the state's nongame and endangered wildlife.

(WDS staff/IDNR)

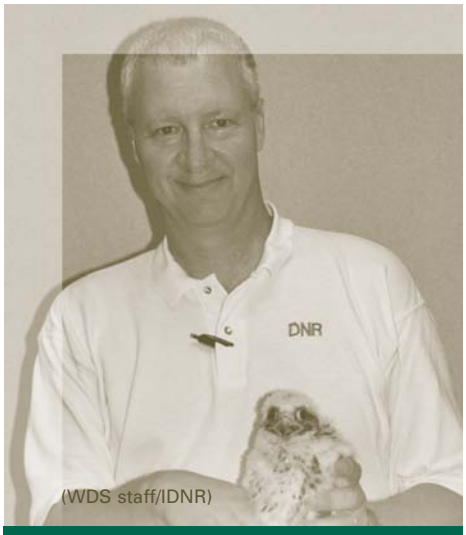
Katie Smith, Wildlife Diversity Section chief

There is no mystery as to how *I* became interested in wildlife. The mystery is, "Why isn't everyone in my family a wildlife biologist?" I spent my summers in a rustic camp house on the banks of Clear Creek in central Louisiana's Grant Parish. From dawn to dusk, we seined, fished, hunted for fossils and explored.

When I was "in town" during the school year, we still had Bayou Roberts in our back yard, full of birds, fish, frogs and nutria. I always wanted to be outside discovering nature. I really didn't "get into" school until college; finally my classes began to reflect my interest.

I received a bachelor's degree in wildlife management from Northwestern State University of Louisiana. I obtained a master's degree and doctorate in zoology (studying animal behavior and population ecology, respectively) at Southern Illinois University-Carbondale.

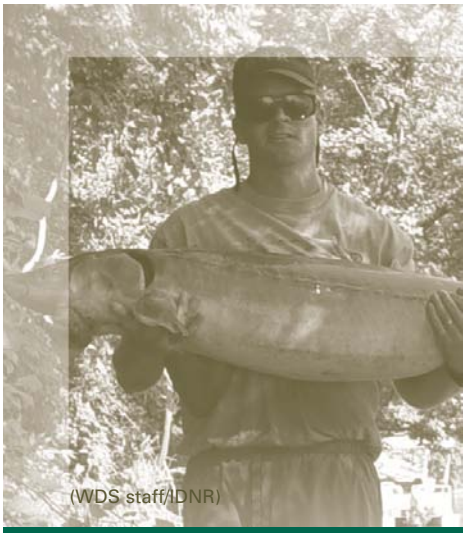
Based solely on my childhood memories in the outdoors, I count myself one of the wealthiest people in the United States. My goal as Wildlife Diversity Section chief is to ensure that future generations can find a similar wealth of experiences in Indiana's natural world.



(WDS staff/IDNR)

John Castrale, avian biologist, with peregrine

A high school biology teacher first got me interested in ecology and environmental sciences. I participated in the first Earth Day celebration in 1970. A trip to Rocky Mountain National Park in Colorado was instrumental in my decision to pursue a wildlife career. I attended Indiana University, and I received a bachelor's degree in wildlife science at Purdue. I also attended West Virginia University, and I obtained my doctorate in wildlife and range resources at Brigham Young University in Utah. I was born a Hoosier and grew up in Evansville.

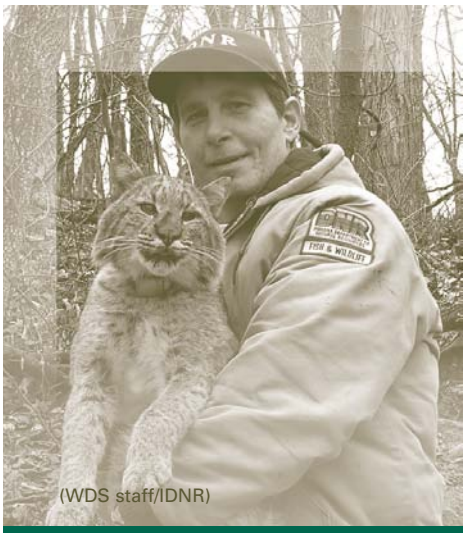


(WDS staff/IDNR)

Brant Fisher, aquatic biologist, with lake sturgeon

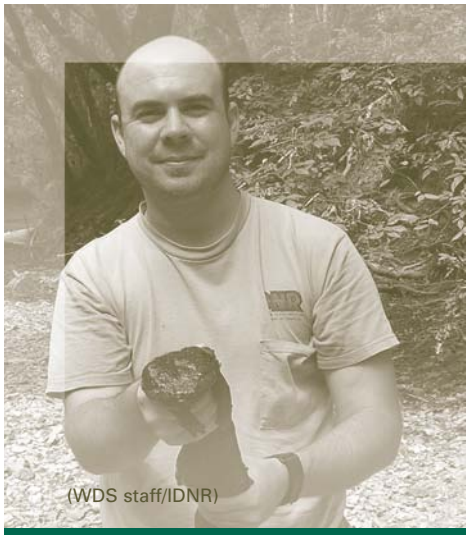
I became interested in working with fisheries the summer after my freshman year in college when I worked as an assistant fisheries biologist in Salem, Oregon, through the Student Conservation Association. After that, I knew I wanted to work in fisheries professionally. I have a

bachelor's degree in biology from Grove City College, Pennsylvania. My master's degree is in aquatic sciences from Purdue University. I joined the DNR in 1995. I've been married for almost 12 years, and I have three boys, Jacob, Brody and Devin, aged 8, 5 and 4. I grew up in Pennsylvania.


(WDS staff/IDNR)

Scott Johnson,
mammologist, with bobcat

I grew up in Warren, a blue-collar town in northeastern Ohio. I have a bachelor's degree in zoology from Ohio University and a master's degree in wildlife management from University of Wisconsin-Stevens Point. I worked for two years in several research positions with the Department of Wildlife Ecology at University of Wisconsin-Madison. I joined the DNR as the mammal biologist in 1986. How I got interested in wildlife is a mystery to me, but perhaps it results from endless hours as a kid catching frogs and turtles in a fairly pristine creek.


(WDS staff/IDNR)

Zack Walker,
herpetologist, with hellbender

I have been interested in wildlife since I can remember. During my college years, I had the opportunity to work with Scott Johnson, the DNR's mammalogist *[see left]*. This experience helped me point my education and career path toward the job I currently have. I am interested in all aspects of biology and enjoy traveling to see new cultures, habitats and species.

I grew up in Bloomington, and I received my bachelor's degree in wildlife science and master's degree in biology from Purdue University. After college, I worked for the Division of Fish and Wildlife as the deer research biologist, taking me to the Bloomington office in my home stomping grounds. I then transferred to my current position as WDS herpetologist.


(WDS staff/IDNR)

Kacie Ehrenberger,
staff specialist

I grew up in Winston-Salem, North Carolina. My father was in a model railroaders club that happened to meet at the cities' Nature Science Center. When I went to meetings with him, I spent most of my time watching the animals and talking to the staff who worked with them. I thought I wanted to be a veterinarian until I discovered I liked working outdoors with all natural resources.

I got my bachelor's degree in forestry and wildlife at Virginia Tech and my master's degree in forestry and natural resources at Purdue University. I was a naturalist for the Indianapolis Parks Department for a year and have been with the Division of Fish and Wildlife for two years.

Supporting Indiana's Wildlife

In 2005 these partners supported various Wildlife Diversity projects:

(Listed in alphabetical order)

Bectren Corporation
Evansville

Cinergy/PSI
Plainfield

D.J. Case and Associates
Mishawaka

Dubois County Rural Electric Cooperative, Inc.
Jasper

Indiana American Water
Greenwood

Indiana Chapter, The Nature Conservancy
Indianapolis

Indiana State University, Department of Geography, Geology and Anthropology
Terre Haute

Indiana State University, Department of Ecology and Organismal Biology
Terre Haute

Midwest Biodiversity Institute
Columbus, Ohio

National Audubon Society
New York City, New York

Purdue University, Department of Forestry and Natural Resources
West Lafayette

How You Can Help!

Contributions to the Indiana Nongame Fund have brought ospreys and bald eagles back to our skies and otters to our waters. The programs discussed in this report as well as many other restoration, management and land acquisition projects implemented by the Wildlife Diversity Section rely on contributions from individuals like you.

Because the WDS depends on donations to the Nongame Fund, we can only conserve Indiana's wildlife with your help. All donors make a difference to our program. A group of schoolchildren learning about endangered species can help by raising money to donate. Conservation-minded Hoosiers can contribute through the income tax check-off.

You can help by donating all or a portion of your tax refund on Line 33 of your IT-40 form, OR donate directly by sending a check or money order to:

Nongame Fund

402 W. Washington St. Rm. W273
Indianapolis, IN 46204
(317) 234-3361

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www.in.gov/dnr/fishwild/endangered/